

Identification of Emissions Sources for Pinal County

Technical Advisory
Meeting
October 27, 2005

DKS Associates

TRANSPORTATION SOLUTIONS





Agenda

1. Introductions
2. Discussion of Revised Work Scope and Schedule
3. Progress on Tasks
4. Review of Scope and Schedule for Remaining Work
5. Next Steps

Discussion of Revised Scope and Schedule

1. Discussion in Sept. '04 TAC meeting reflected a shift in direction on ozone and PM₁₀ analysis
2. Schedule was extended to allow for revised scope
3. Budget was increased to reflect increased effort for PM₁₀ analysis
4. ***Budget was increased to add unpaved road treatment testing and analysis***

Examine Ozone as a Regional Issue Correlated with Growth

- ◆ Shift away from identification of sources for elevated monitor readings
- ◆ Produce county-wide estimates of emissions of ozone precursors
- ◆ Examine the implications of alternative assumptions about growth and travel characteristics

Shift in Direction on the PM₁₀ Analysis

- ◆ Shift away from identification of sources for elevated monitor readings
- ◆ Focus on dirt roads as a source
- ◆ Develop a tool for predicting concentration based on roadway volume and soil characteristics
- ◆ Include the development of a “Blueprint” for the development of a PM₁₀ Attainment Plan
- ◆ ***Include the testing of unpaved road treatment control efficiency***

Progress on Tasks

Task 1 – Define Geographical Scope and Analysis Framework

Task 2- Assemble and Collect Data

Task 3 Prepare and Analyze Emissions Estimates

Task 4 Prepare Project Reports

Task 5 Prepare PM₁₀ Attainment Plan Blueprint

Task 6 – Test Unpaved Road Treatment Control Efficiency

Task 1 – Define Geographical Scope and Analysis Framework

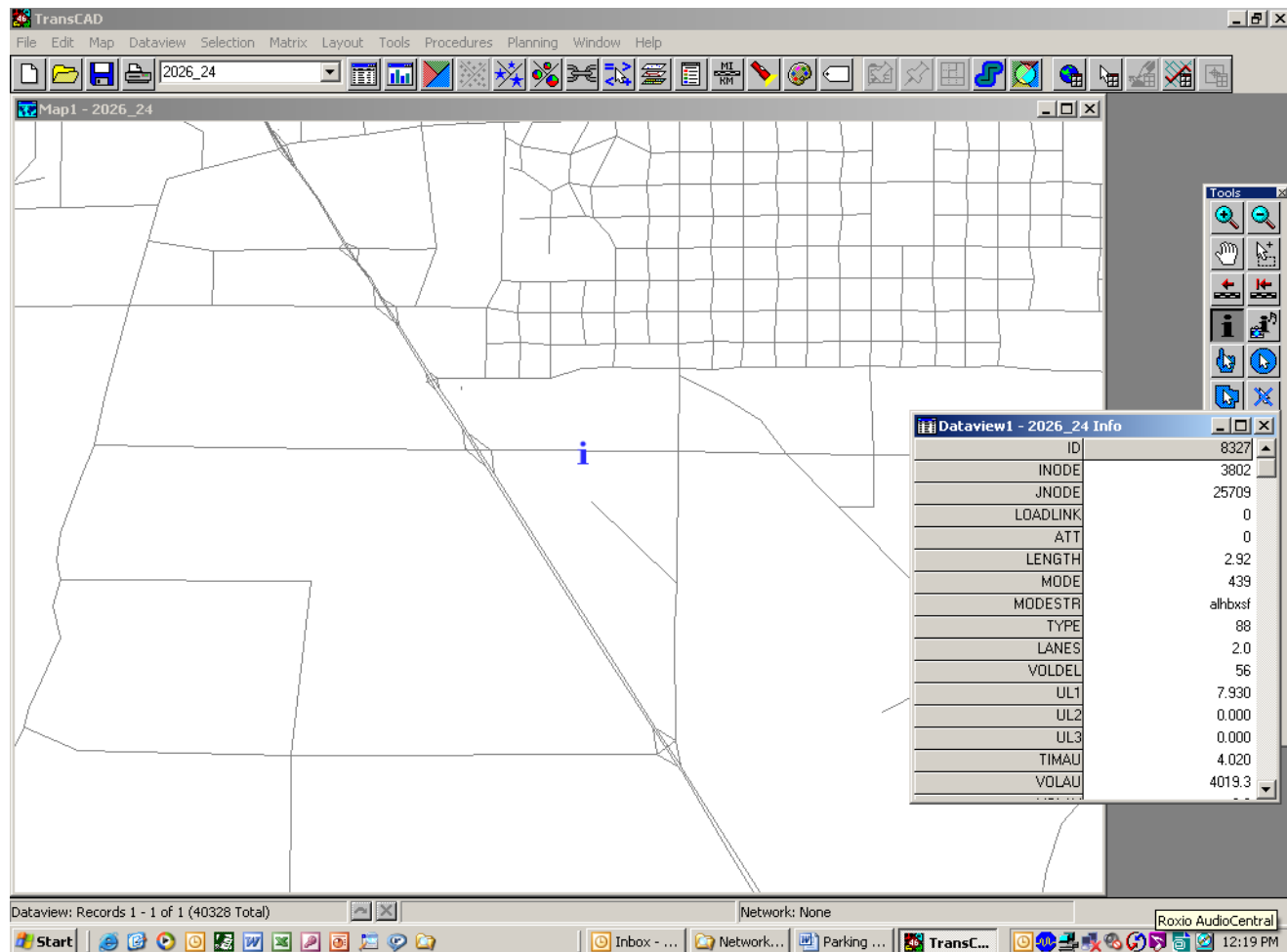
- ◆ Completed with the revised scope, schedule and budget
 - ▶ Geographic Coverage – County-wide but case-study areas for PM₁₀
 - ▶ Analysis Timeframe – Current and 2025
 - ▶ Schedule – Extend 6 months to February '06
 - ▶ Budget – Increased by \$40,000 for PM₁₀ Attainment Plan Blueprint **and \$14,400 for Unpaved Road Testing**

Task 2- Assemble and Collect Data: Ozone Analysis

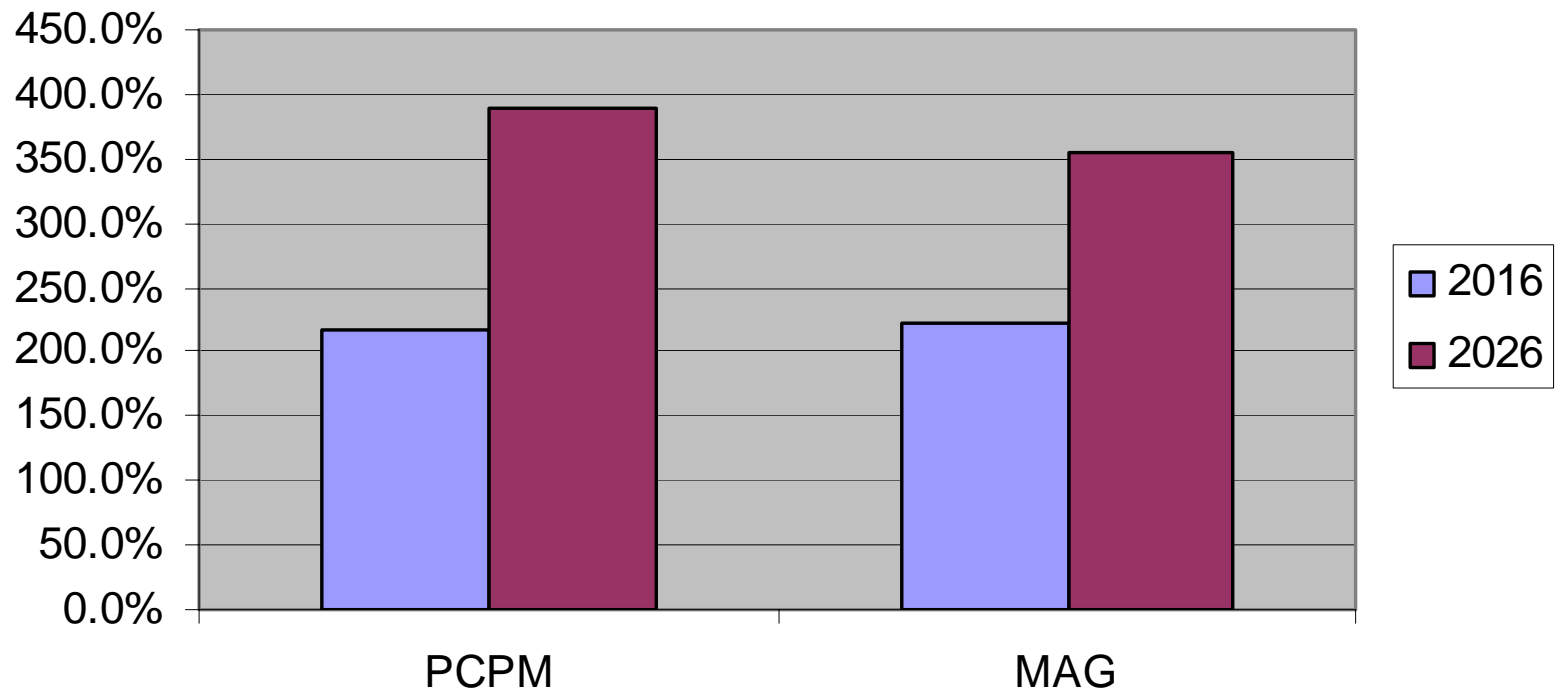
Completed

- ◆ Roadway inventory assembled in GIS
- ◆ Traffic counts assembled in GIS database
- ◆ MOBILE6 analysis conducted
- ◆ Forecasts of growth in population, employment and travel were obtained from MAG and from ADOT's Pinal Corridors Planning Model (PCPM)

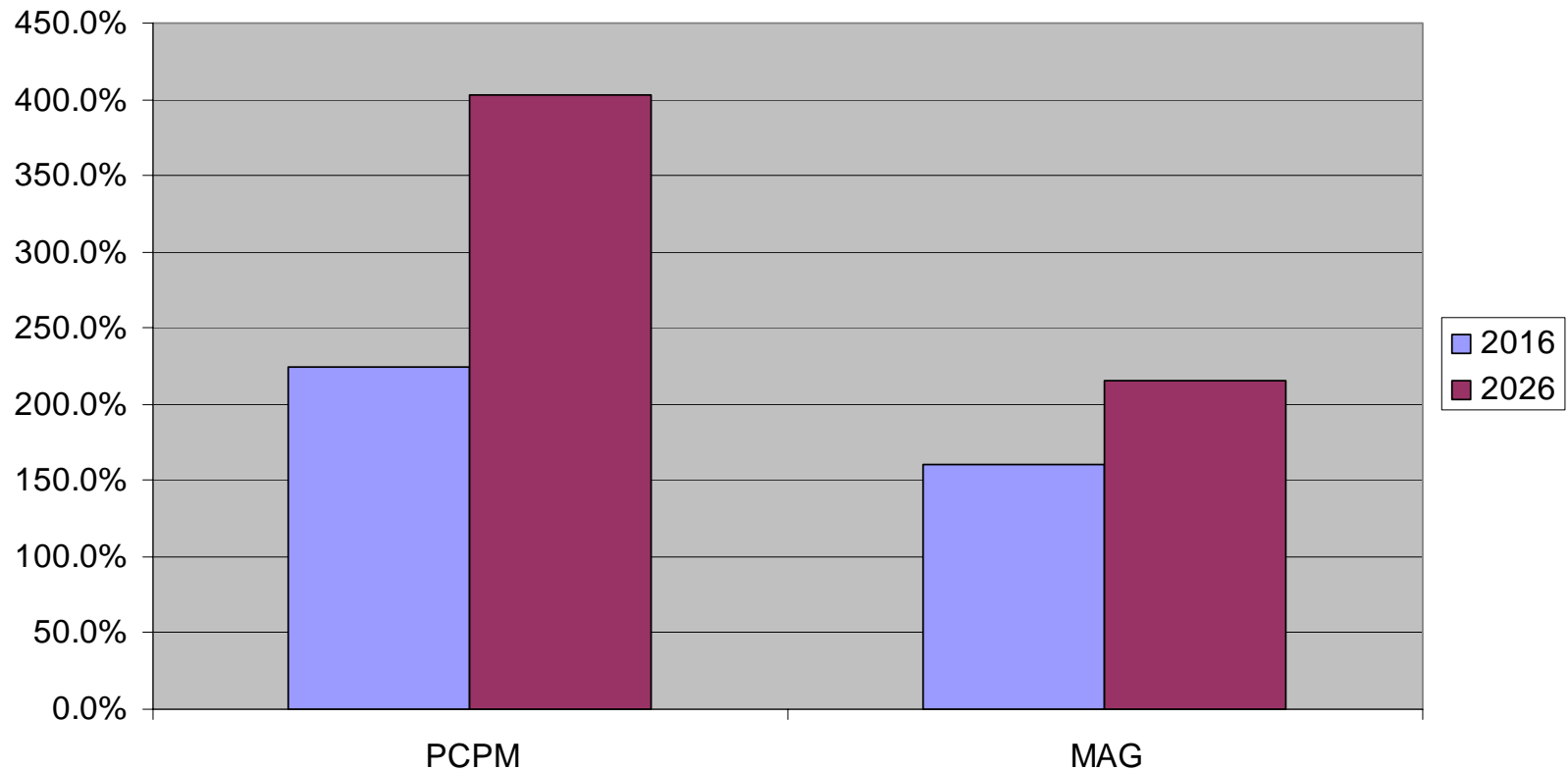
Networks, Counts and Forecasts in GIS Format



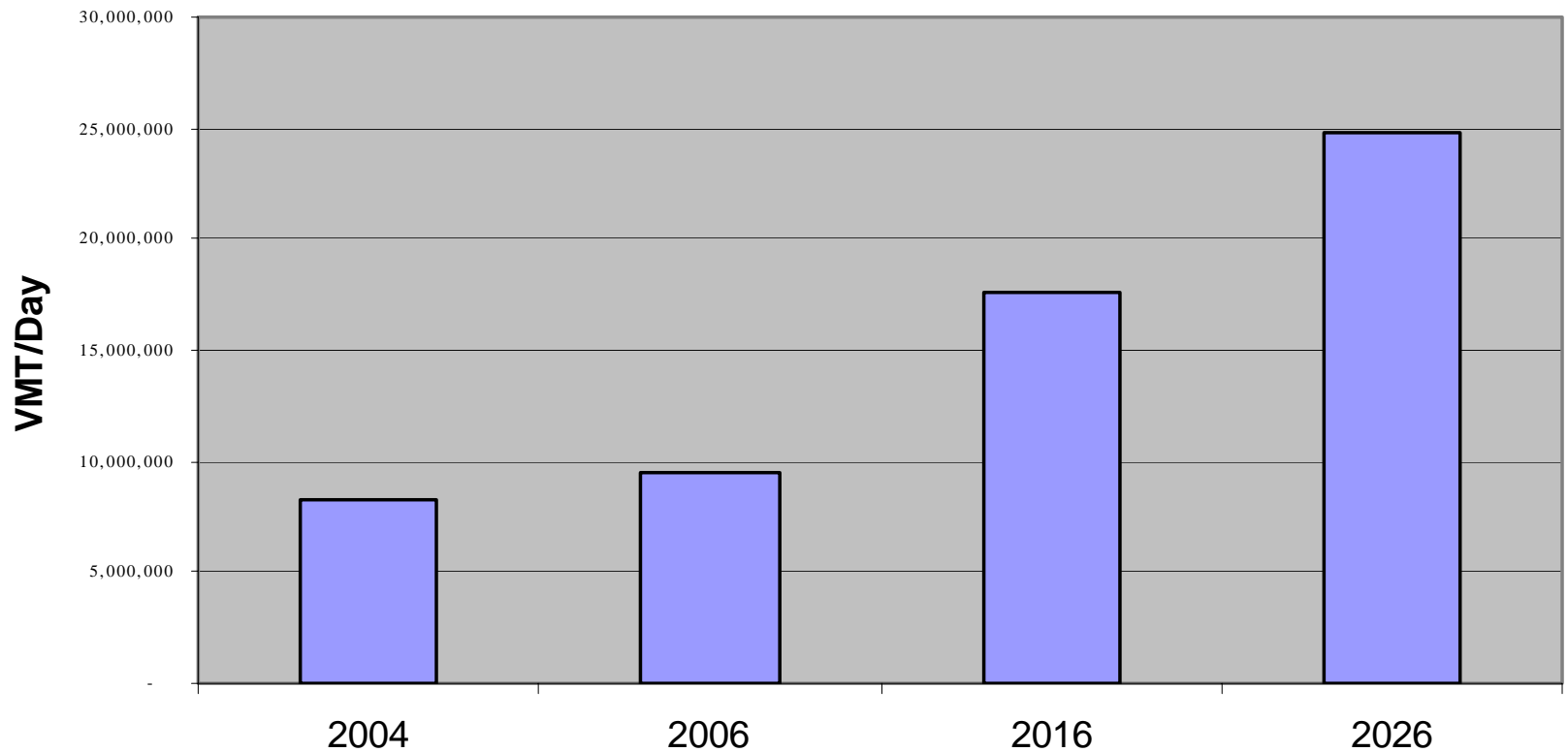
Comparison of Future Forecasts of Population in Pinal County as a Percentage of Existing (2006) Population



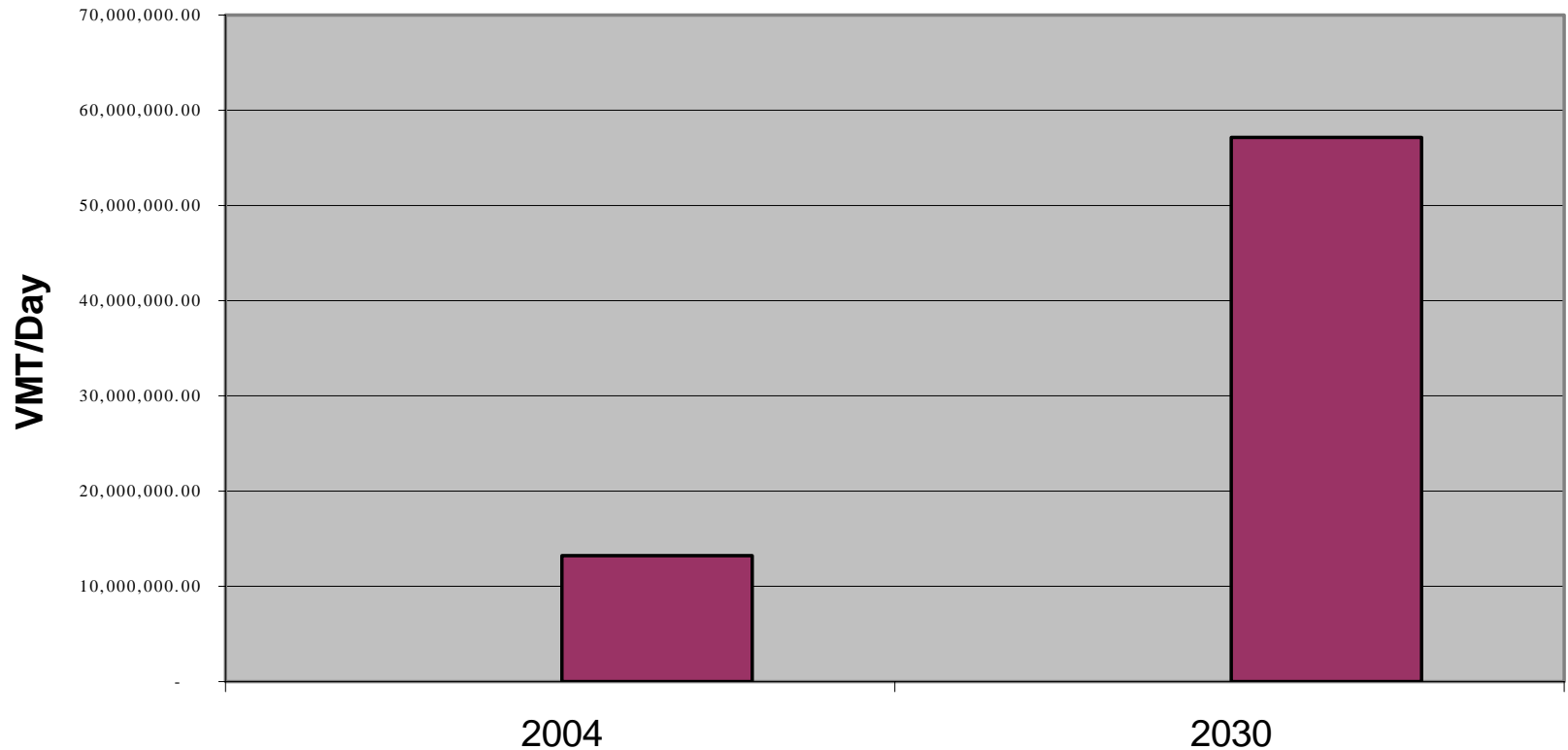
Comparison of Future Forecasts of Employment in Pinal County as a Percentage of Existing (2006) Employment



Estimated Growth in Travel based on MAG Forecast



Estimated Change in Travel based on PCPM Forecast



Task 2- Assemble and Collect Data: PM₁₀ Analysis

Completed

- ◆ Monitored traffic volumes, speed and vehicle sizes on five unpaved road segments
- ◆ Collected ***and analyzed*** unpaved road surface soil samples at same locations
- ◆ Received and reformatted meteorological data for dispersion modeling purposes

Task 2- Assemble and Collect Data: PM₁₀ Analysis

Remaining

- ◆ *All elements of this task completed*

Task 3 Prepare and Analyze Emissions Estimates: Ozone Analysis

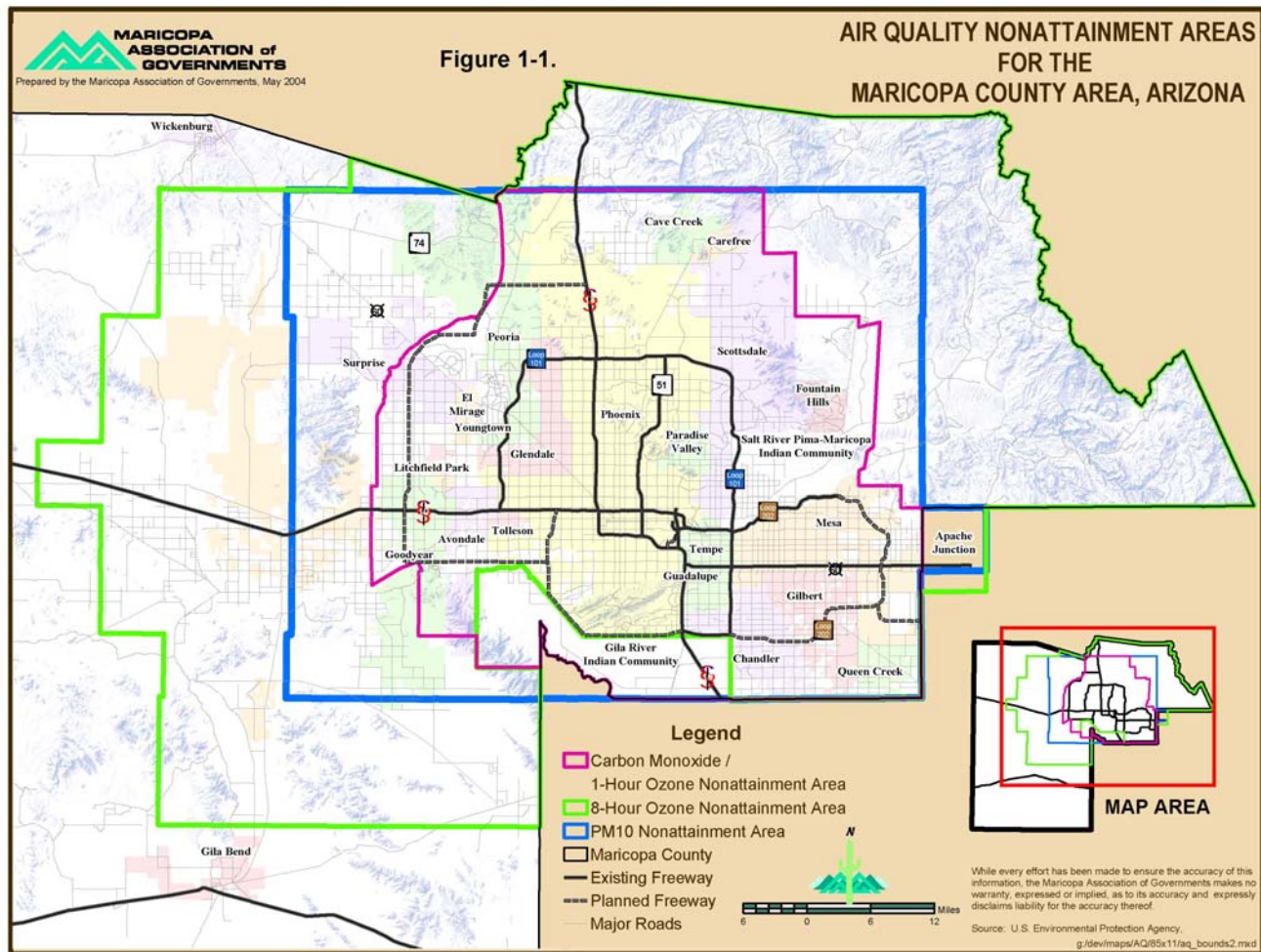
Completed

- ◆ Prepared VOC and NOx emission estimates for 2006, 2016 and 2026 from MAG conformity analysis
- ◆ Prepared emission estimates for 2004, and 2030 from PCPM
- ◆ Possible implications of growth for ozone concentrations analyzed

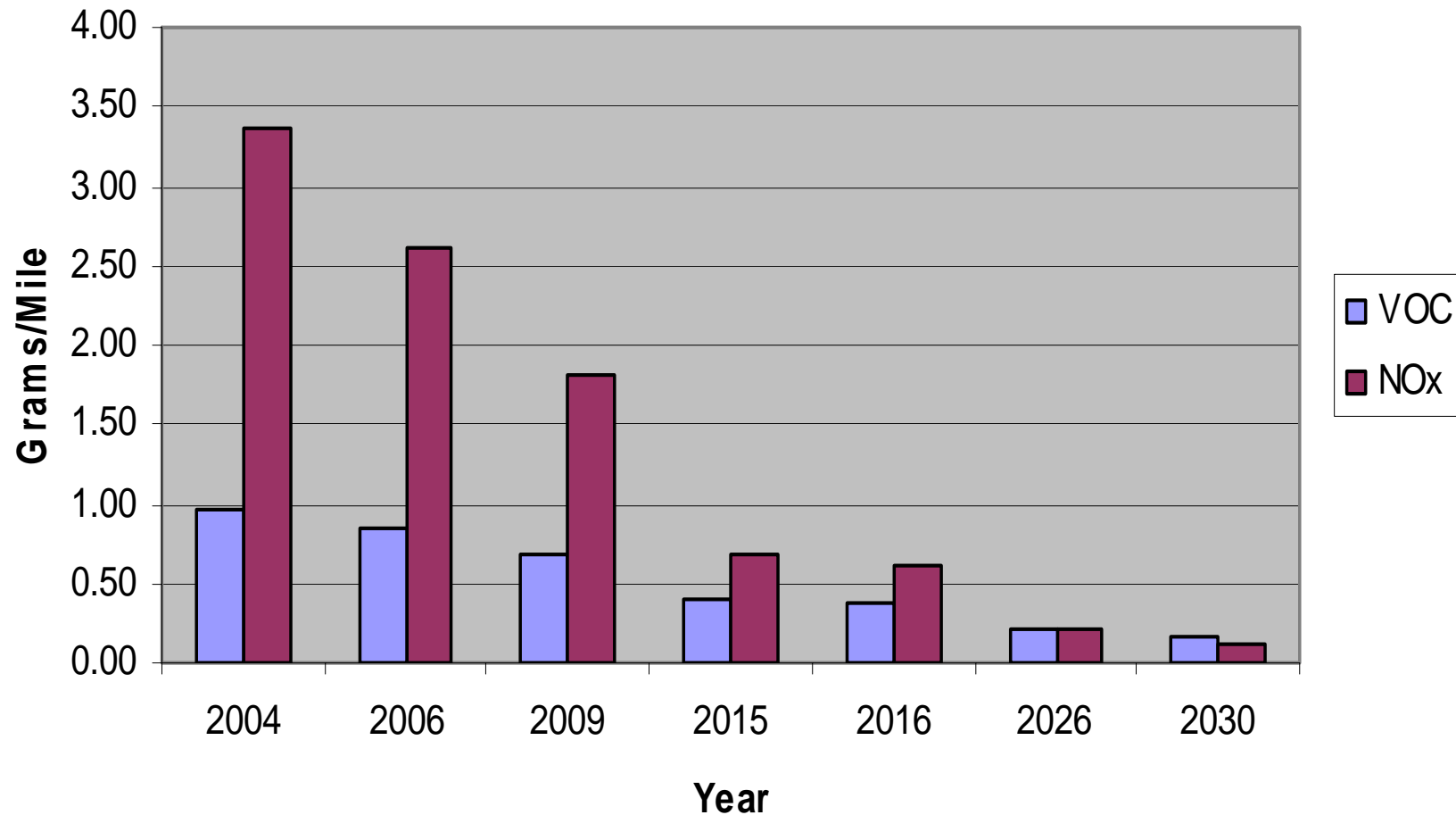
Remaining

- ◆ ***All elements of this task completed***

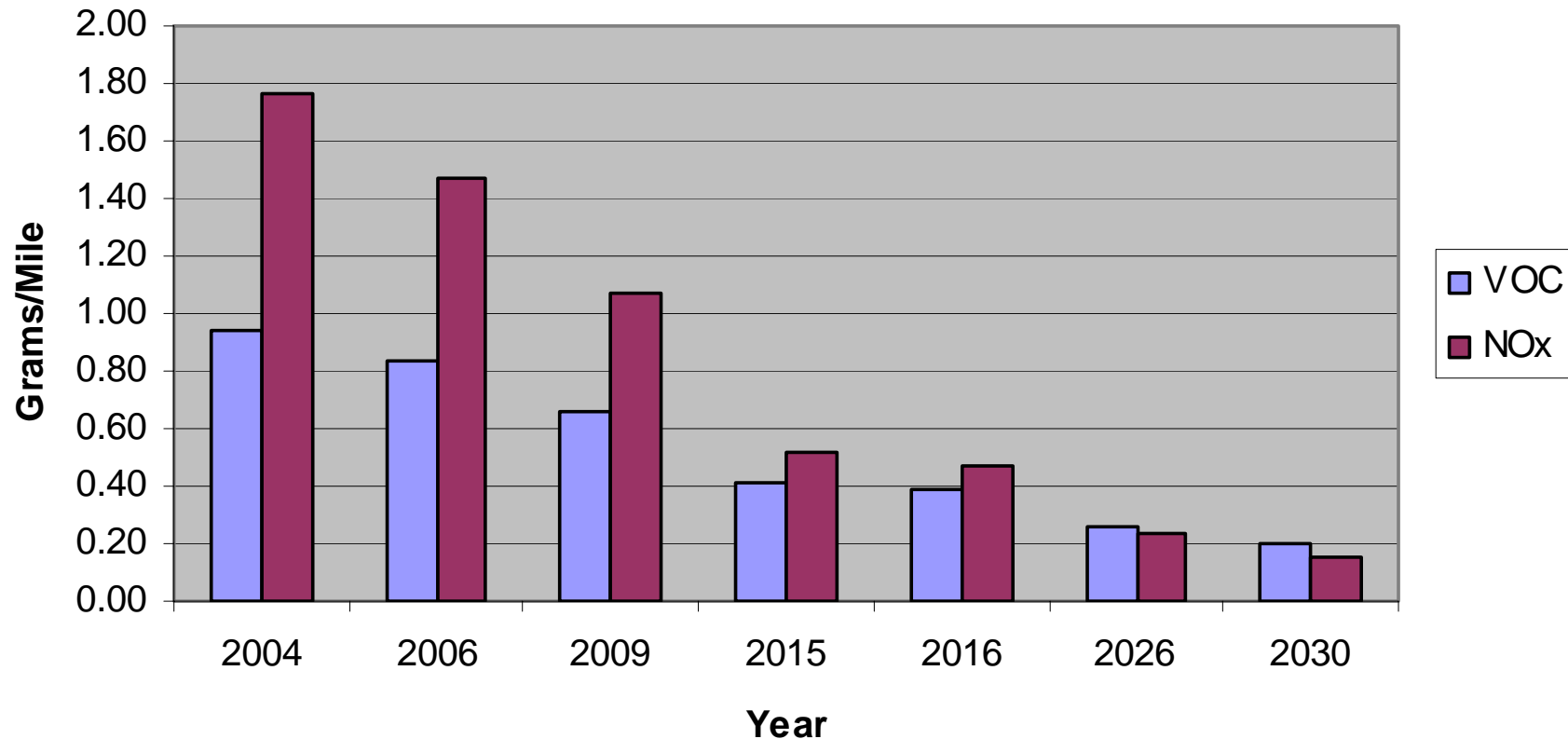
Maricopa County Area Non-Attainment Areas



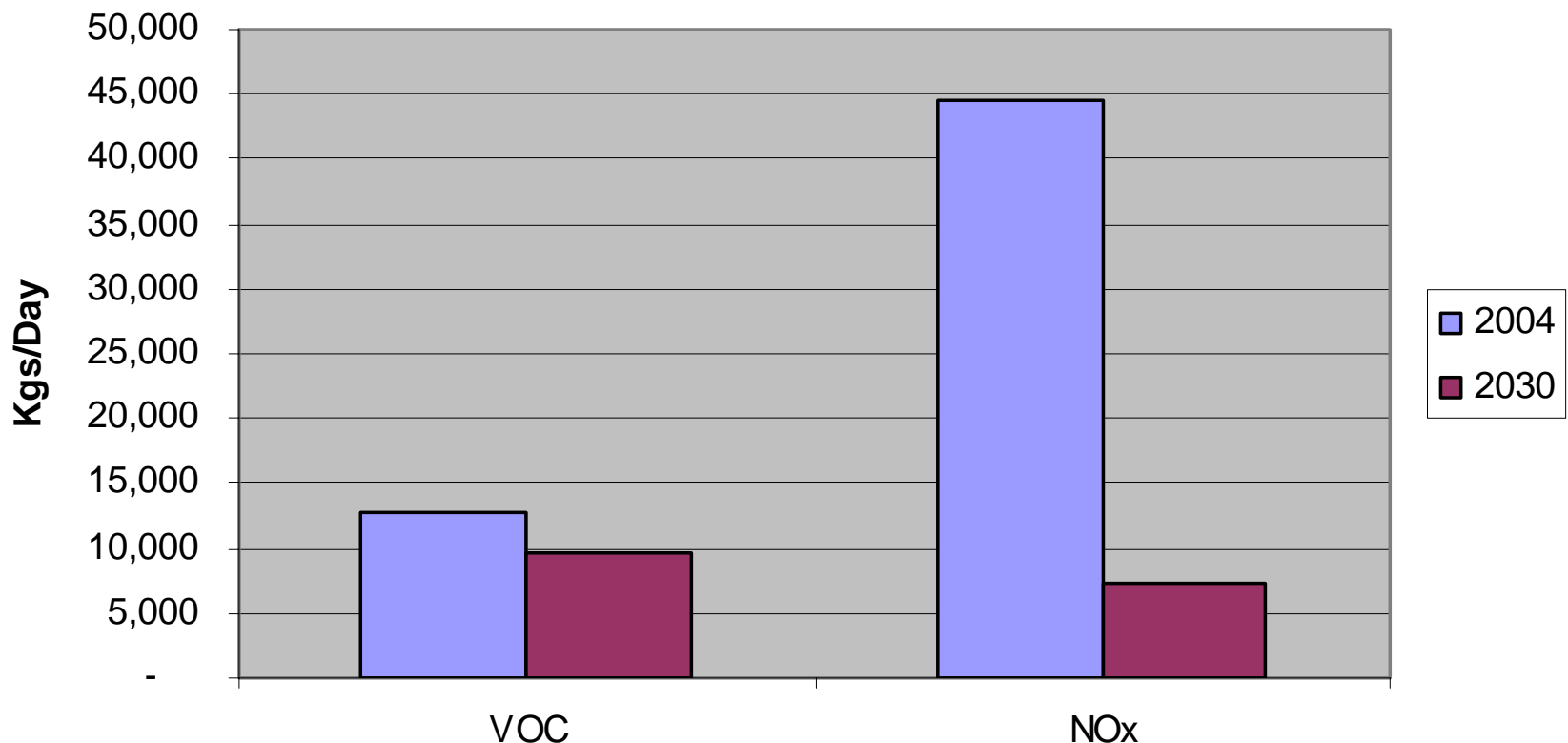
Average Emission Rates by Year for the Donut Area



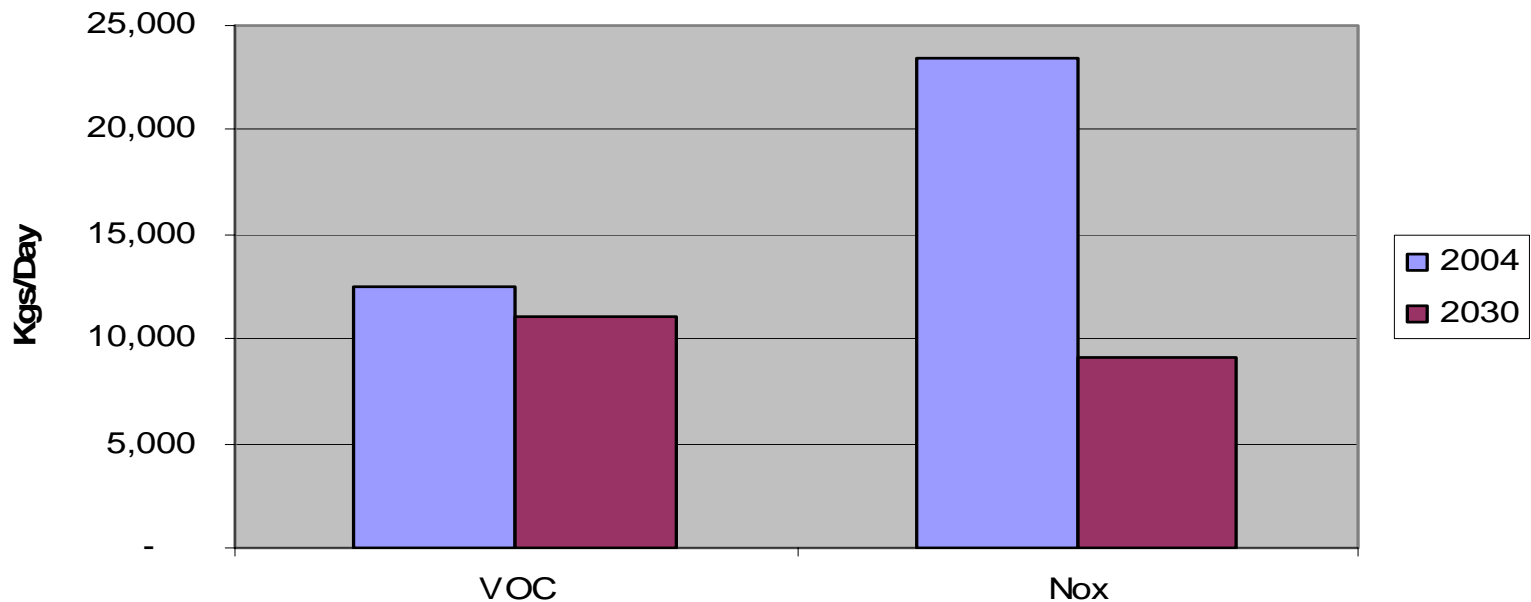
Average Emission Rates by Year for the 8-Hour Ozone Non-Attainment Area



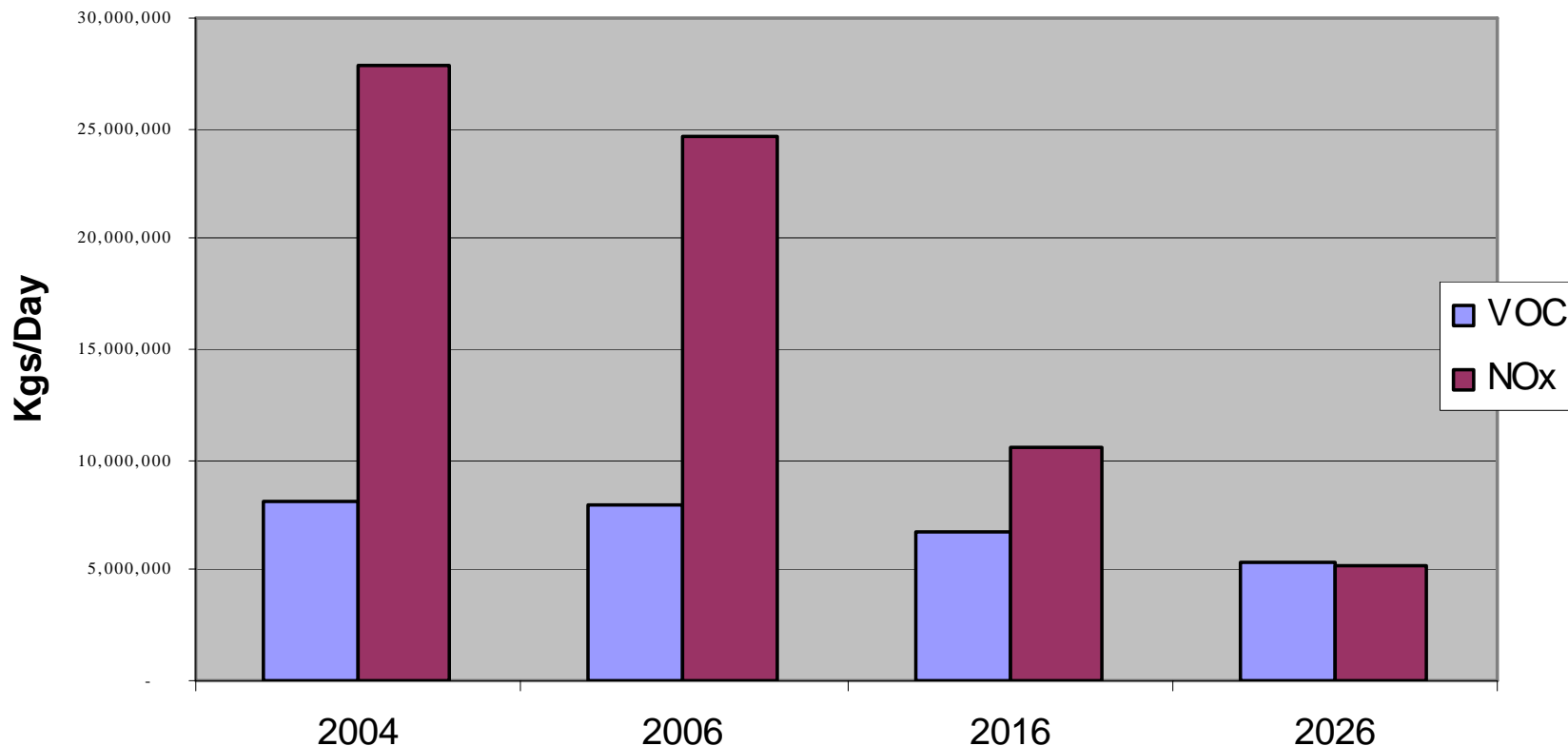
Estimated Mobile Source Pollutant Emissions in Pinal County based on PCPM Forecasts and Donut Area Rates



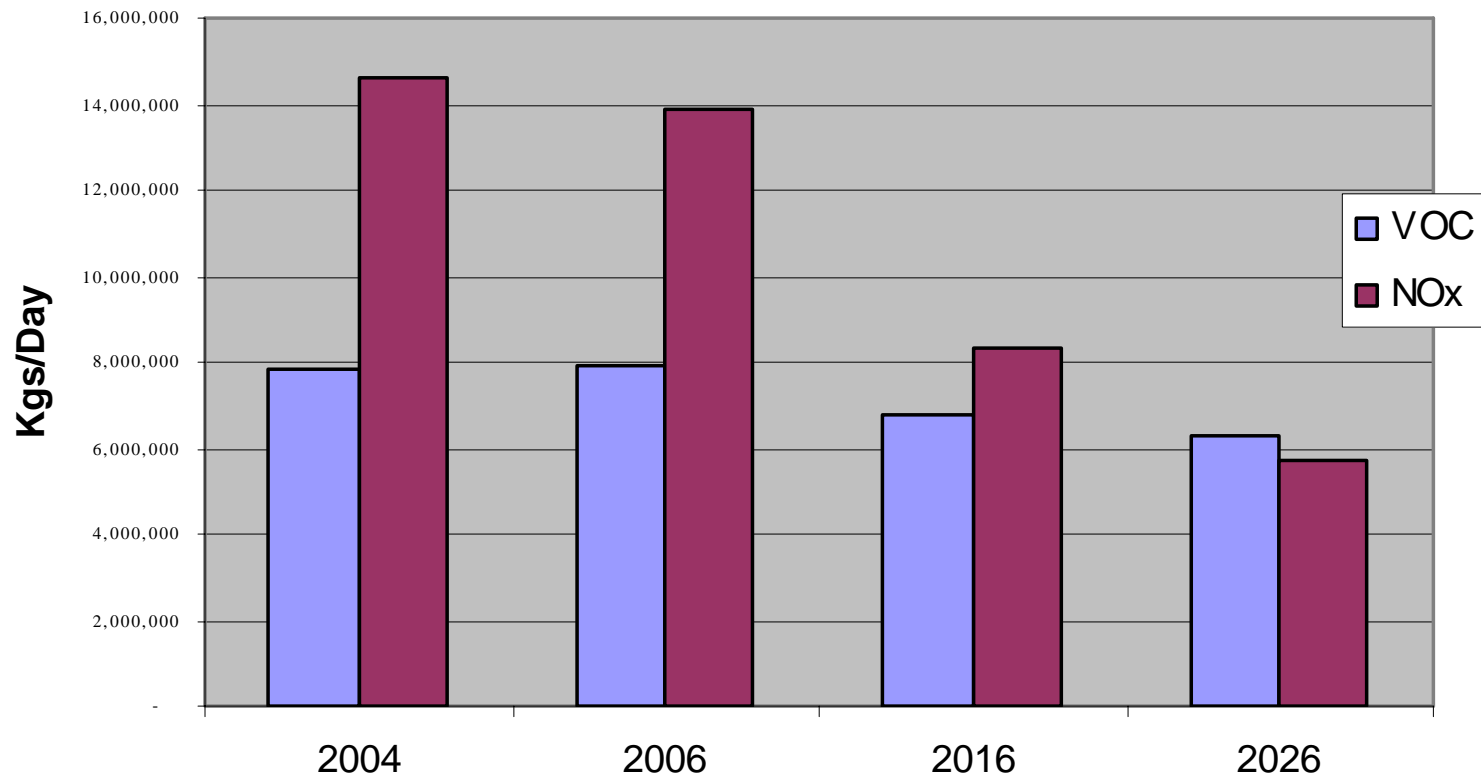
Estimated Mobile Source Pollutant Emissions in Pinal County based on PCPM Forecasts and 8-Hour Non-Attainment Area Rates



Estimated Mobile Source Pollutant Emissions in Pinal County based on MAG Forecasts and Donut Area Rates

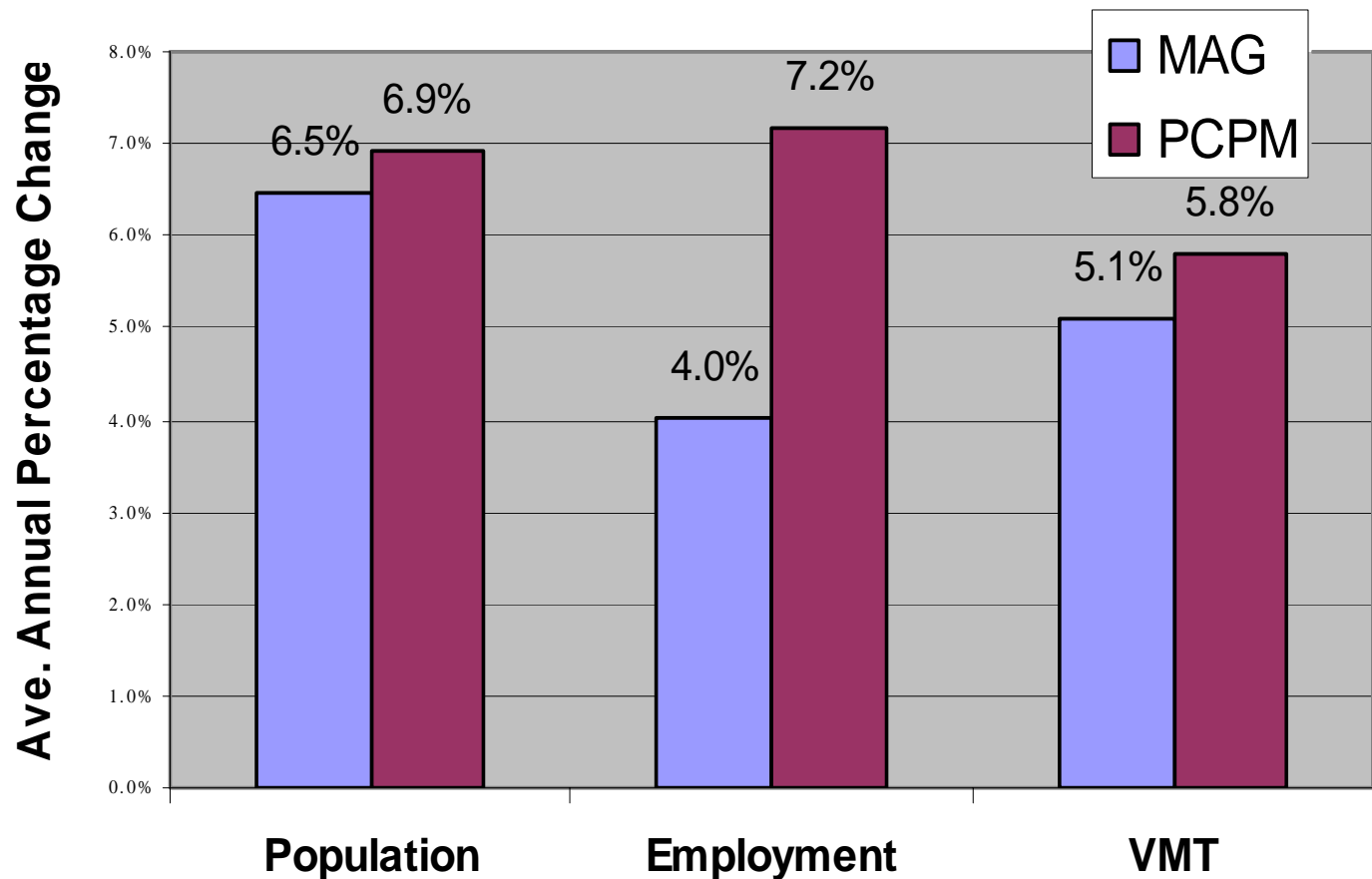


Estimated Mobile Source Pollutant Emissions in Pinal County based on MAG Forecasts and 8-Hour Non-Attainment Area Rates

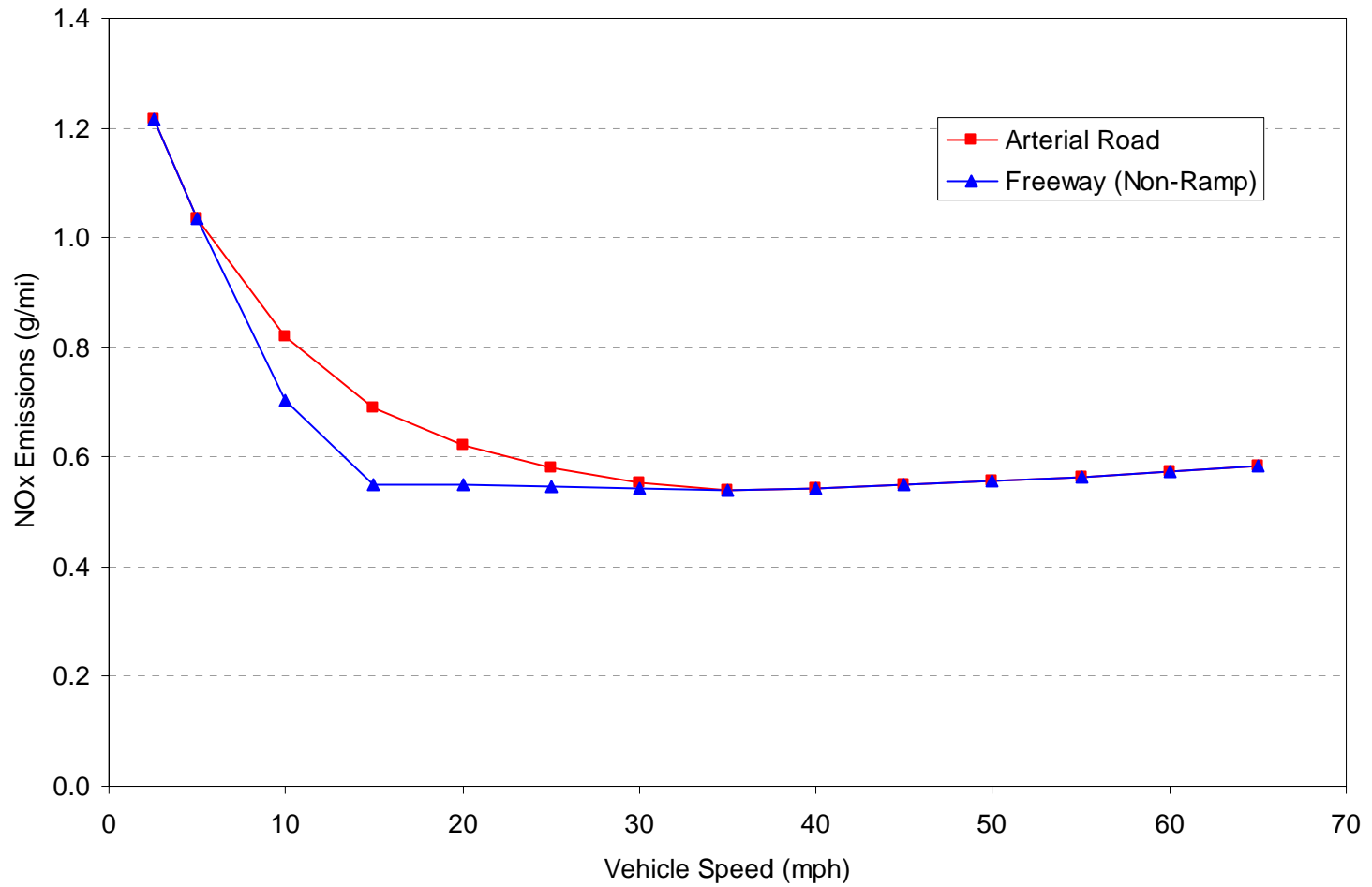


Comparison of Growth Rates with Emission Rate Reductions:

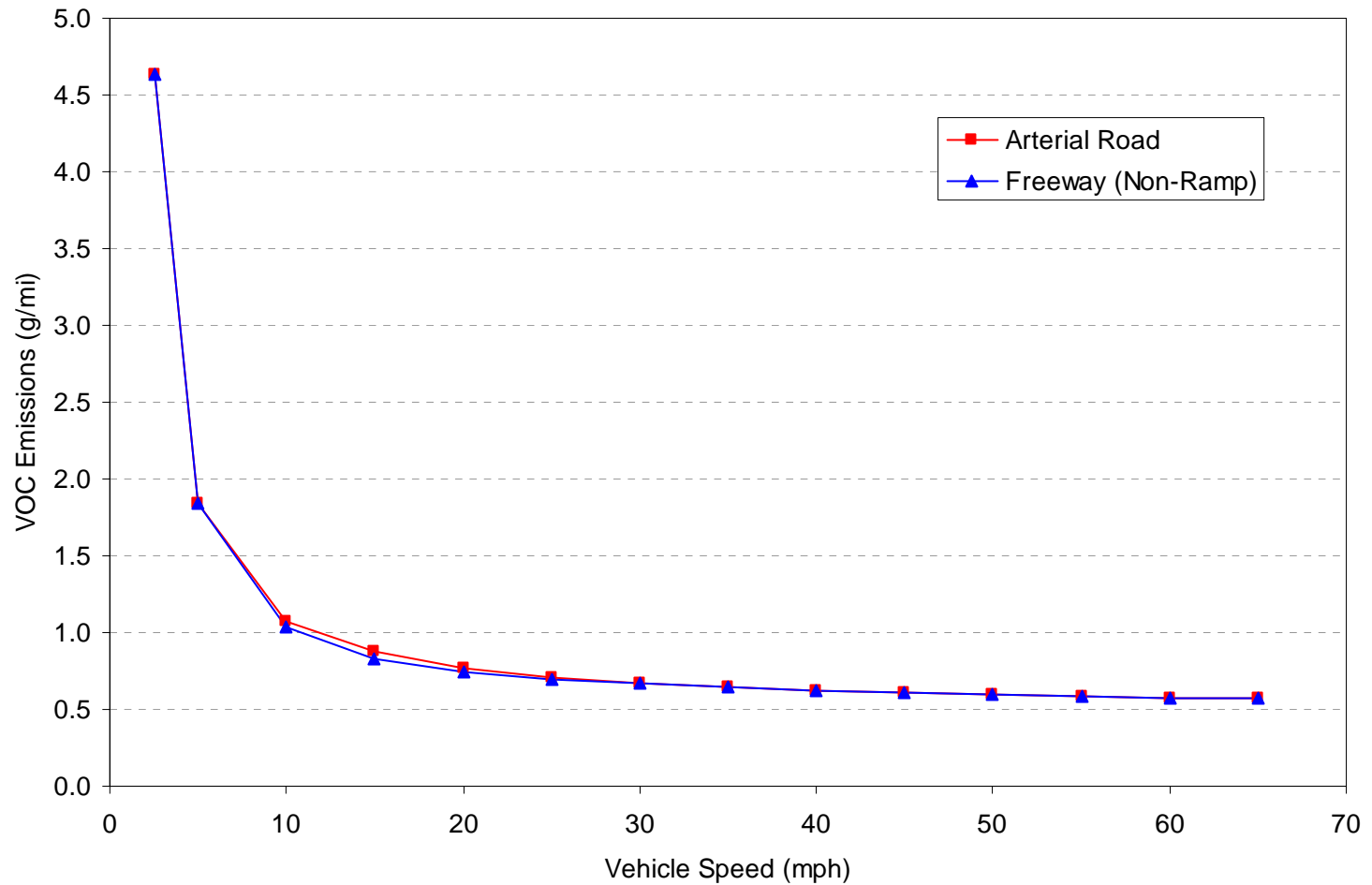
VOC: 5.8 - 6.5%/year NOx: 8.9-11.9%/year



LDGV NOx Emissions by Average Facility Speed (MOBILE6 National Fleet Defaults)



LDGV VOC Emissions by Average Facility Speed (MOBILE6 National Fleet Defaults)



Conclusions about Ozone Precursor Emissions

- ◆ Growth in travel will be dramatic in Pinal County
- ◆ The nature of travel in Pinal County will change – more internal travel and a lower share of heavy-duty vehicles in the fleet mix
- ◆ Average emission rates for VOC and NOx will drop
- ◆ Total emissions of VOC and NOx will almost certainly be lower in twenty years

Task 3 Prepare and Analyze Emissions Estimates: PM₁₀ Analysis

Completed

- ◆ Unpaved road emissions equations set up to receive silt content, moisture content and speed data
- ◆ Dispersion model set up with local meteorological data to receive emissions data
- ◆ ***Unpaved road emissions analysis***
- ◆ ***Dispersion modeling of unpaved road emissions***
- ◆ ***Spreadsheet tool for analyzing unpaved road air quality impact***

Task 3 Prepare and Analyze Emissions Estimates: PM₁₀ Analysis

Remaining

- ◆ ***Complete analysis of control efficiency and cost effectiveness of unpaved road control measures***

Task 4 Prepare Project Reports: Ozone and PM₁₀ Analyses

Completed

- ◆ Progress reports
- ◆ *User's manual for unpaved road spreadsheet tool*

Remaining

- ◆ *Prepare task reports for Tasks 1 – 3*
- ◆ *Prepare Final Report*

Task 5 Prepare PM₁₀ Attainment Plan Blueprint

Completed

- ◆ Initial analysis of Pinal County PM₁₀ monitoring data
- ◆ Serious PM₁₀ non-attainment areas with problems similar to Pinal County were identified
- ◆ Attainment plans of three areas were reviewed to determine future air quality forecasting techniques
- ◆ An initial literature search of air quality planning in development was conducted

Task 5 Prepare PM₁₀ Attainment Plan Blueprint

Remaining

- ◆ Complete final analysis of Pinal County PM₁₀ air quality data
- ◆ Complete review of PM₁₀ forecasting models used in other serious non-attainment areas
- ◆ Complete evaluation of forecasting models under development

Task 6 Test Unpaved Road Treatment Control Efficiency

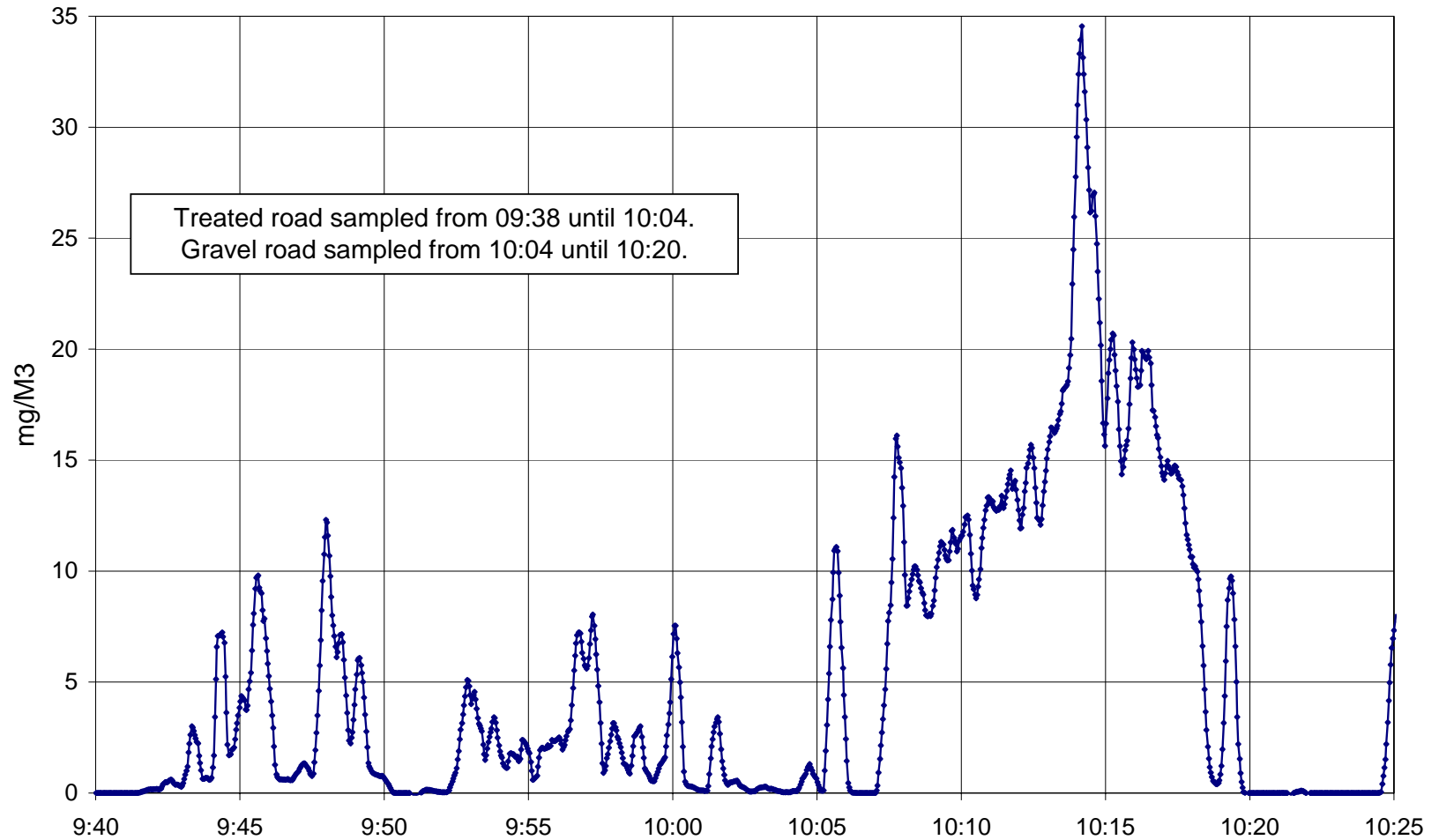
Completed

- ◆ ***Emission data collection from treated and untreated sections of unpaved roads***

Remaining

- ◆ ***Analysis of unpaved road treatment control efficiency***

Treated and Untreated Road Comparison 10/10/05



Review of Scope and Schedule for Remaining Work

1. Emissions Estimates for Ozone Analysis
2. Unpaved Road Model Tool
3. PM₁₀ Attainment Plan Blueprint
4. ***Unpaved Road Treatment Control Efficiency***

Emissions Estimates for Ozone Analysis

4th Quarter 2005

- ◆ *Prepare task report*

Unpaved Road Model Tool

4th Quarter 2005

- ◆ ***Review comments on draft modeling tool and user's manual and prepare final versions***
- ◆ ***Complete analysis of control efficiency and cost effectiveness of unpaved road control measures***

PM10 Attainment Plan Blueprint

4th Quarter of 2005

- ◆ ***Complete analysis of Pinal County PM10 data***
- ◆ ***Complete review of PM10 forecasting models in other serious non-attainment areas***
- ◆ ***Complete draft of Blueprint report***
- ◆ ***Complete draft of Final Report***

Unpaved Road Treatment Control Efficiency

4th Quarter of 2005

- ◆ ***Analyze control efficiency of unpaved road treatments***
- ◆ ***Prepare task report***

Next Steps

- ◆ Proceed with work in remaining tasks
- ◆ TAC meet again in February to discuss final documentation

